DETAILED DISCRIPTION

The normal operation of the Lorcin line of semi-automatic handguns begins with the slide being manually pulled back to start the firing cycle, as the slide 16 moves to its rearward position, it contacts a circular cylinder on the firing pin, not shown, and carries the firing pin rearward until it makes contact with the front of the sear, not shown, at this point the cylinder on the firing pin , not shown, travels up and over the angled side of the sear, dislodging itself from the slide 16 and is locked in place behind the sear, the slide continues it rearward movement until it makes contact with the stationary firing pin stop guide 42 as shown in FIG 14 and 15. Once the slide 16 is released it moves forward under spring tension, where the feeding notches, not shown, make contact with the first round in the magazine, not shown, stripping it from the magazine forcing it into the chamber, not shown, locking the slide 16 in position, the trigger 20 when pulled, moves the sear downwardly releasing the firing pin cylinder, the spring tension on the rear of the cylinder forces the firing pin forward, impacting the primer of the round causing the round to fire. The slug is forced out through the barrel, the explosive gases and spring tension forces the slide rearward carrying the spent shell casing that contacts the extractor, not shown, the casing is thrown clear by the ejector, not shown, through the ejector port, not shown, on the right side of the slide 16. The slide continues its rearward movement engaging the firing pin cylinder, which contacts the sear and locks in place, the slide moves forward under spring tension feeding the next round into the chamber, pulling the trigger starts the cycle again, until the magazine is empty.

For this reason the Mumbleau, 5,467,550 and other similar locking mechanisms, referred to in this material will not be suitable.

The lockable safety mechanism 1 is shown for reference and descriptive purposes installed in semi-automatic handgun 2, although many types of semi-automatic handguns are suitable for use without modification. The lockable safety mechanism 1 is shown installed in the Lorcin model L380,.380 mm semi-automatic handgun, it is shown as a representative example of the manner and best mode contemplated for utilizing the lockable safety mechanism 1 as described herein.

The present invention will be more fully understood by reference to the drawing, which will show one preferred embodiment of a lockable safety mechanism of the present invention, variations and modifications of this embodiment, such as size and location, can be substituted without departing from the principles of the invention, as will be evident to those skilled in the art.

The preferred embodiment of the lockable safety mechanism1 shown in the figures is pictured in a handgun having a manual safety switch of the general type. This type of manual safety switch is used in a wide variety of semi-automatic handguns, with and without a hammer assembly. In addition to being adaptable for use in a wide variety of handguns, the various embodiments of the lockable safety mechanism of the present invention can be located in various positions on the handgun with respect to the location of the manual safety switch. The particular location of the lockable safety mechanism of the present invention will vary depending on the type of handgun, the type of manual safety switch and other considerations that will be evident to those skilled in the art.

Accordingly various embodiments of the lockable safety mechanism of the present invention can be incorporated into almost any semi-automatic handgun, in almost any location. Furthermore, it can be used to block any manual safety switch, so long as such blockage would satisfy accepted safety measures and standards.

The wide applicability of the present invention will be more evident to those skilled in the art as a result of the disclosure of the general operating principles of the preferred embodiment of the invention shown in FIGS. 1-15. In FIGS. 1-15, the embodiment of the lockable safety mechanism of the present invention are shown on handguns adapted for use by right-handed operators, however, the invention is equally adaptable to handguns for left-handed operators.

The function of the lockable safety mechanism of the present invention can be described in general terms that are applicable to a wide variety of embodiments thereof, including those shown in the figures and discussed in detail below, as will be apparent to those skilled in the art.

The lockable safety mechanism of the present invention is moveable between two rotational positions, the first being the safe and locked position wherein the lockable safety mechanism prevents movement of the manual safety switch and thus prevents the trigger from being pulled and causes the slide to be locked in place. Once in the safe and locked position, the manual safety switch cannot be rotated or moved without a key.

As shown in the figures, the lockable safety mechanism of the present invention comprises 7 major parts, 5 roll pins, and 2 springs. These components are best shown in FIG 12, which is an exploded view of the components of the preferred embodiment of the lockable safety mechanism shown herein. The preferred embodiment of this lockable safety mechanism of the present invention comprises a lock assembly 1, consisting of an outer casing 25, inner casing29, lock core 24, frontend cover 22, two locking arms 27, five roll pins 26, flared at one end, baseplate 30, two torsin springs 32, and a key 38,which is the preferred locking means. The lockable safety mechanism also has a left end or key way, right end attached to the handgun, and a top end and bottom end as shown in FIG. 3.

As shown in FIGS. 1 and 2, the lockable safety mechanism 1 is positioned within the trigger assembly housing 17 of the handgun, as shown in FIGS. 3-6, the preferred embodiment of the lockable safety mechanism 1 is substantially cylindrical and comprises a lock core 24 that rotates when the key 38 is inserted and turned. The lock core 24 has three grooves 23 milled into it along its longitudinal axis and extend from right end to left end, within these grooves 23, two locking arm slots 31, are cut in two of the key grooves 23, as shown in FIG. 11, which the locking arms 27 are secured by roll pins 26 in a position that permits the locking arms 27 to swivel back and forth. Two torsin springs 32 provide the necessary tension for recoil, when the key 38 is inserted and removed.

The lock core 24 of the preferred embodiment of the present invention is basically a solid semi-circle, see FIGS. 11 an 12 that has been milled and cut to accommodate the locking arms 27 and the key, the lock core 24 has drilled pin holes 34 to accommodate the roll pins 26A-E as shown in FIG. 12. The lock core 24 is adapted to receive a portion of the manual safety switch 21 and thereby allowing movement of the switch 21 when the lockable safety mechanism is in the fire position as shown in FIGS. 2 and 15 and block the manual safety switch 21 when the lock or safe position as shown in FIGS. 1, 4 and 14. The locking arms 27 are secured in place by roll pins 26 A and B inserted through the pin holes 34 as shown in FIGS. 11 and 12, the torsin springs 32 are attached to the bottom of the core 24 by roll pin 26 D and attached to the bottom of the locking arms 27 as shown in FIG. 9. The inner casing 29 of the preferred embodiment of this invention is of the same basic shape as the lock core 24 and is secured to the lock core 24 by roll pin 26B and C inserted in the top and bottom of the inner casing 29 as shown in FIG 12, through pin holes 34.

The outer casing 25 of the preferred embodiment of this invention is circular in configuration with a pin guide slot 28 cut into the bottom as shown in FIGS. 3, 10, and 12 Through which a roll pin 26E is inserted as a guide for the lock core 24 and to secure the outer casing 25 to the inner casing 29 and the lock core 24. In the present embodiment of this invention the outer casing 25 has a slot 45 in an offset but substantially central portion of the top between the two ends, and is position to allow the manual safety switch 21 to contact the lock core 24 when lockable safety mechanism 1 is in the fire position, as shown in FIGS. 2, 5 and 15. When the lockable safety mechanism 1 is placed in the safe position, the manual safety slot 45 is filled by the lock core 24, and prevents the manual safety switch 21 from being moved into the fire position as shown in FIGS. 1, 4 and 14.

The preferred embodiment of this invention also contains a baseplate 30, that ha three built in locking lugs 31 as shown in FIGS. 8 and 12 which are formed at the same time the baseplate 30 is cut. These locking lugs 31 engage the ends of the locking arms 27 to prevent the core 24 from turning without the key as shown in FIGS. 4-12.

The preferred embodiment of this invention also included a locking means or key 38 which has two parts, key ring 37 and a key body 36. The key 38 also has two built in disengaging notches 39 formed in the bottom of the key body 36, as shown in FIG. 13.

Once these components are assembled they form a cohesive unit that can be added to any semi-automatic hand gun, regardless of where it is placed on the body of a handgun.

To place the lockable safety mechanism 1 in the safe position the locks core 24 is rotated to a position that blocks the movement of the manual safety switch 21, thus effectively.rendering the hand gun inoperative, and cannot be fired without the key 38 as shown in FIG. 1 and 14. When the key 38 is inserted in the front or left end of the lockable safety mechanism 1 the key notches 39 depress the locking arm 37, releasing them from the locking lugs 31 permitting the lock core 24 to be rotated to the fire position, as shown in FIG. 2 and 15. These principles will be evident to those skilled in the art The preferred embodiment of this invention contains parts that are cost effective to make and easy to assemble as shown FIG. 12 and will be evident to those skilled in the art.

The baseplate 30 is brazed or welded to the bottom of the outer casing 25 with the locking lugs 31 aligned with the locking arm slots 35, the lock care 24 is assembled by
placing the locking arm 27A into the locking arm slot 35A and secured to the lock core

24 with roll pin 26A pressed into pin hole 34, locking arm 27B is aligned with arm slot 35B, at this point the inner casing 29 is moved into place and both inner casing 29 and locking arm 35B are secured to the lock core with roll pin 26B through pin hole 34, roll pin 26C is inserted through the opposite side of inner casing 29 into lock core 24, torsin springs 32 are placed on the right end of the locking arms 27A and B and secured to lock core 24 with roll pin 26D as shown in FIG. 5,9,11, and 12. The outer casing 25 is moved into position, aligned and secured to the inner casing 29 and lock core 24 with roll pin 26E, at this point the unit is ready for the left end cover 22 to be attached . The lockable safety mechanism is ready for installation on the handgun , which is drilled to size . when the lockable safety mechanism, minus the front end cover, is inserted through the inside surface of the handgun, it snaps in place. The front end cover is placed over the exposed end and snaps into place. The installation of the lockable safety mechanism is complete, and becomes a permanent part of the handgun, thus eliminating the need to remove or install a device each time the handgun is used.